What is Claimed is:

1. A system for generating a signal for transmission in non-contiguous frequency bands that are separated by at least one segment of frequency spectrum excluded from use in transmitting the signal, comprising:

a processor that generates a digital time-domain signal;

a non-contiguous spectrum selector that converts the digital time-domain signal to a frequency-domain signal, excises a portion of the frequency-domain signal corresponding to the at least one segment of frequency spectrum, and converts the excised frequency-domain signal to an excised time-domain signal; and

a digital-to-analog converter that converts the excised time-domain signal to an analog signal for transmission.

2. The system of claim 1, wherein the non-contiguous spectrum selector comprises:

a discrete Fourier transform module that converts the digital time-domain signal to the frequency-domain signal, wherein the frequency-domain signal comprises a plurality of frequency-domain samples corresponding to respective frequency bins;

an excision module that selectively removes frequency bins to cause spectral nulling at the at least one segment of frequency spectrum excluded from signal transmission; and

an inverse discrete Fourier transform module that converts the excised frequency-domain signal to the excised time-domain signal.

3. The system of claim 2, wherein the discrete Fourier transform module comprises a fast Fourier transform (FFT) and the inverse discrete Fourier transform module comprises an inverse FFT.

4. The system of claim 3, wherein the discrete Fourier transform module includes windowing to shape the frequency response of the frequency bins.

5. The system of claim 1, wherein digital time-domain signal is a baseband signal.

6. The system of claim 5, further comprising:

a digital mixer that up-converts the excised time-domain signal to an intermediate frequency signal and supplies the intermediate frequency signal to the digital-to-analog

converter.

7. The system of claim 6, further comprising a reconstruction filter that receives the analog signal from the digital-to-analog converter and supplies a filtered intermediate signal to an RF transmission module.

8. The system of claim 1, wherein the signal is a spread spectrum signal.

9. The system of claim 8, wherein the digital time-domain signal comprises a sequence of samples of chips.

10. The system of claim 1, wherein the signal includes data for transmission to a communication device.

11. The system of claim 1, wherein the signal is a ranging waveform for determining a range between two communication devices.

12. The system of claim 1, further comprising a receiver comprising:

an analog-to-digital converter that converts a received signal to a received digital time-domain signal; and

a receiver spectrum selector that converts the received digital time-domain signal to a received frequency-domain signal, excises a portion of the received frequency-domain signal corresponding to the at least one segment of frequency spectrum, and converts the excised received frequency-domain signal to an excised, received time-domain signal.

13. The system of claim 12, further comprising a time of arrival processor that determines a time of arrival of the received signal from the excised, received time-domain signal.

14. The system of claim 12, further comprising a communications acquisition processor that acquires the received signal from the excised, received time-domain signal.

15. The system of claim 12, wherein the receiver spectrum selector performs

interference excision.

16. The system of claim 1, wherein the system comprises a modem including a transmitter and a receiver, wherein the transmitter includes the non-contiguous spectrum selector.

17. The system of claim 1, wherein the system comprises a communication device that includes the processor, the non-contiguous spectrum selector and the analog-to-digital converter.

18. The system of claim 17, wherein the communication device is a mobile communication device.

19. The system of claim 1, wherein the system comprises a plurality of communication devices communicating in a network.

20. A method for generating a signal for transmission in non-contiguous frequency bands that are separated by at least one segment of frequency spectrum excluded from use in transmitting the signal, comprising:

(a) generating a digital time-domain signal;

(b) converting the digital time-domain signal to a frequency-domain signal;

(c) excising a portion of the frequency-domain signal corresponding to the at least one segment of frequency spectrum to produce an excised frequency-domain signal;

(d) converting the excised frequency-domain signal to an excised time-domain signal; and

(e) converting the excised time-domain signal to an analog signal for transmission.

21. The method of claim 20, wherein:

(b) includes converting the digital time-domain signal to the frequency-domain signal via a windowed fast Fourier transform (FFT), wherein the frequency-domain signal comprises a plurality of frequency-domain samples corresponding to respective frequency bins;

(c) selectively removing frequency bins to cause spectral nulling at the at least one

segment of frequency spectrum excluded from signal transmission; and

(d) includes converting the excised frequency-domain signal to the excised time-domain signal via an inverse FFT.

22. The method of claim 20, wherein digital time-domain signal is a baseband signal.

23. The method of claim 22, further comprising:

(f) up-converting the excised time-domain signal to an intermediate frequency signal.

24. The method of claim 20, wherein the signal is a spread spectrum signal, and the digital time-domain signal comprises a sequence of samples of chips.

25. The method of claim 20, wherein the signal includes data for transmission to a communication device.

26. The method of claim 20, wherein the signal is a ranging waveform for determining a range between two communication devices.

27. The method of claim 20, further comprising:

(f) converting a received signal to a received digital time-domain signal;

(g) converting the received digital time-domain signal to a received frequency-domain signal;

(h) excising a portion of the received frequency-domain signal corresponding to the at least one segment of frequency spectrum; and

(i) converting the excised received frequency-domain signal to an excised, received time-domain signal.

28. The method of claim 27, further comprising:

(j) determining a time of arrival of the received signal from the excised, received time-domain signal.